



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Short communication

COVID-19 and psychiatric admissions: An observational study of the first six months of lockdown in Melbourne

Karuppiyah Jagadheesan, FRANZCP, Consultant Psychiatrist^{a,b,*}, Vijay Danivas, FRANZCP, Consultant Psychiatrist^a, Quratulain Itrat, FRANZCP, Consultant Psychiatrist^a, Lokesh Sekharan, FRANZCP, Consultant Psychiatrist^a, Assoc Prof Vinay Lakra, FRANZCP, Director of Clinical Services^{a,b}

^a North West Area Mental Health Services, Melbourne Health, Melbourne, Australia

^b Department of Psychiatry, University of Melbourne, Australia



ARTICLE INFO

Keywords:

COVID-19

Lockdown

Inpatient treatment

ABSTRACT

Research on the effect of a prolonged lockdown on inpatient admissions is limited. In this background, this study was planned, and it included patients admitted to inpatient units of a large mental health network in Melbourne during the lockdown (March 16–September 16, 2020) and a similar time period in 2019. The results showed a 12% decrease in admissions. The lockdown period included patients with lower mean age and more patients with never married status, higher education status, students and patients with home duties, and certain psychiatric diagnoses. Overall, the patients needing inpatient treatment during a prolonged lockdown are different.

Introduction

The COVID-19 pandemic and lockdown have negative effects on the population and mental health services (Fisher et al., 2020; World Health Organization, 2020). Until now, only a few studies have examined how the pandemic and lockdowns could influence acute psychiatric admissions (Abbas et al., 2020; Clerici et al., 2020; Itrat et al., 2020; Tromans et al., 2020). Many studies found a substantial reduction in hospital admissions during the pandemic and lockdown (Abbas et al., 2020; Clerici et al., 2020; Tromans et al., 2020). A change in diagnostic groups was also reported. Abbas et al. (2020) found an increase in non-affective psychotic disorders and bipolar affective disorders, whereas Clerici et al. (2020) reported a reduction in bipolar affective disorder diagnosis.

Studies have so far used a short timeframe, i.e., 6–8 weeks study period and a similar length of time in the same year or in previous years as control periods, to assess the effect of pandemic or lockdown on inpatient admissions (Abbas et al., 2020; Clerici et al., 2020; Itrat et al., 2020; Tromans et al., 2020). Many countries have implemented extended periods of lockdown as the COVID-19 pandemic is still progressing. The State of Victoria implemented lockdown measures since 16

March 2020 due to successive first and second waves of the COVID-19 pandemic. Hence, we wanted to investigate the effects of the first six months of the lockdown on the number of inpatient admissions and the nature of patients receiving inpatient treatment.

Methods

This observational study, with cross-sectional and retrospective in design, compared the nature of patients who needed inpatient hospital treatment during the first six months of the COVID-19 lockdown in Melbourne, i.e., 16 March -16 September 2020. A similar period in 2019 was the control period (16 March -16 September 2019). This study was based on inpatients units four adult mental health services (beds = 128) of the North Western Mental Health (NWMH) network of Melbourne Health. The NWMH provides psychiatric services to more than 1.2 million residents in the north and west of the metropolitan Melbourne. In NWMH, the inpatient units are expected to have a minimum two discharges per day, which is a key performance index (KPI), to maintain bed availability to meet demands. Following the initiation of lockdown in Melbourne, the community teams within the service have changed

Acknowledgement: The authors thank Sanjit Tisseverasinghe for data extraction. Conflict of interest: None to be declared. Financial disclosure: None to be declared.

* Corresponding author at: North West Area Mental Health Services, 35 Johnstone Street, Broadmeadows, VIC 3047. Department of Psychiatry, The University of Melbourne, Parkville, VIC 3052, Australia.

E-mail address: Karuppiyah.Jagadheesan@mh.org.au (K. Jagadheesan).

<https://doi.org/10.1016/j.psychres.2021.113902>

Received 2 January 2021; Accepted 21 March 2021

Available online 23 March 2021

0165-1781/© 2021 Elsevier B.V. All rights reserved.

their model of care by reducing direct contact hours, use of telepsychiatry, reduced home visits and allowing some staff to work from home.

We collected socio-demographic and clinical variables, as in [table 1](#), from the hospital databases. All diagnoses were based on ICD-10 AM. Data were de-identified and secured to meet privacy and confidentiality requirements. The Melbourne Health Human Research Ethics Committee approved this study. Descriptive statistics and inferential statistics (Chi-Square test and independent t test) with alpha (significance) level ≤ 0.05 were carried out through SPSS Ver. 27.0.

Results

Total sample was 3660 (n = 1843, for the control group; n = 1817, for the lockdown group). After exclusion of patients with no clear diagnosis (2019, n = 356; 2020, n = 510), the final sample included 1487 and 1307 patients with a clear psychiatric diagnosis in the control and lockdown periods, respectively (i.e., a 12.1% reduction).

The mean age of the patients admitted during the lockdown was significantly less (37.92 ± 11.90 vs 39.54 ± 11.66 , $p < 0.001$). Compared to the control period, the lockdown period included more patients with never married status ($p = 0.03$), education status higher than years 7-10 ($p = 0.019$), and studying or home duties ($p = 0.044$). On clinical variables, the lockdown period included higher rate of psychotic disorders, mood disorders, and personality disorders ($p < 0.001$). Groups were not

Table 1
Characteristics of patients

Variables	Control group	Lockdown group	X ² /t	p
	n(%) / Mean \pm SD	n(%) / Mean \pm SD		
Age (years)	39.54 \pm 11.66	37.92 \pm 11.90	3.62	<0.001
Gender				
Male	873 (58.8)	745 (57.0)	0.87	0.352
Female	612 (41.2)	561 (43.0)		
Relationship status				
Never married	812 (67.6)	732 (72.7)	6.883	0.032
Separated	159 (13.2)	111 (11.0)		
Married (partnered)	231 (19.2)	164 (16.3)		
Education				
School 7-10	363 (42.7)	262 (36.7)	9.95	0.019
School 11-12	301 (35.4)	255 (35.8)		
Tertiary	166 (19.5)	165 (23.1)		
Vocational	21 (2.5)	31 (4.3)		
Employment				
Unemployed/pensioner	1166 (81.4)	999 (78.9)	8.11	0.044
Student	44 (3.1)	61 (4.8)		
Home duties	25 (1.7)	33 (2.6)		
Employed	197 (13.8)	173 (13.7)		
Living status				
Alone	441 (39.7)	410 (41)	9.23	0.1
Parents	331 (29.8)	310 (31)		
Spouse or partner	141 (12.7)	87 (8.7)		
Child(ren)-dependent	19 (1.7)	22 (2.2)		
Friends and others	149 (13.4)	141 (14.1)		
Supported accommodation	29 (2.6)	29 (2.9)		
Language				
English	1389 (93.8)	1227 (94.0)	0.067	0.796
Others	92 (6.2)	78 (6.0)		
Admission legal status				
Voluntary	669 (45.0)	620 (47.4)	1.68	0.195
Compulsory	818 (55.0)	687 (52.6)		
Diagnostic category				
Organic disorder	3 (0.2)	1 (0.1)	186.2	<0.001
Substance use disorder	123 (8.3)	107 (8.2)		
Psychotic disorder	814 (54.7)	810 (62.0)		
Mood disorder	263 (17.7)	246 (18.8)		
Anxiety disorder	5 (0.3)	8 (0.6)		
Personality disorder	93 (6.3)	135 (10.3)		
Others	186 (12.5)	0 (0.0)		
Length of stay (in days)	12.98 \pm 15.86	13.08 \pm 12.81	0.167	0.867

different in other variables ([table 1](#)).

Discussion

This is the first study to investigate the effect of prolonged lockdown on psychiatric admissions. Within the sample of inpatients with a confirmed psychiatric diagnosis, we found a 12% reduction in the total number of inpatients during the lockdown period, which is lower than 20-31% reported previously ([Abbas et al., 2020](#); [Clerici et al., 2020](#); [Tromans et al., 2020](#)). We did not find a substantial reduction in admissions previously ([Itrat et al., 2020](#)), which could have been because this study included only one inpatient unit. Potential reasons for the current findings include fear of infection in the hospitals, changed threshold for hospital admission ([Clerici et al., 2020](#)), cessation of day leaves and no visitor policy in the hospitals during the lockdown in Victoria. Exclusion of patients with unclear psychiatric diagnoses could also have affected our estimate of the changes in admissions.

We found patients who are somewhat younger, not in relationship, better educated and not working due to studies or home duties appeared to need inpatient treatment in the lockdown period. These findings disagree our previous study ([Itrat et al. 2020](#)) in which there was no group difference in age and also, more patients had a separated status. Unlike [Clerici et al. \(2020\)](#), we did not notice any reduction or increase in voluntary admissions in our current study, a finding similar to our previous study ([Itrat et al., 2020](#)). It is possible that the effects of hospital setting and longer duration of the lockdown might have contributed to these differences.

We noted patients with certain diagnoses such as psychotic disorders, mood disorders, and personality disorders at higher rates during the lockdown. [Abbas et al. \(2020\)](#) found a similar increase in psychotic disorders and bipolar affective disorder, but they noted a reduction in personality disorder diagnosis. Conversely, [Clerici et al. \(2020\)](#) noted a significant reduction only for bipolar affective disorder diagnosis. We did not find any difference in diagnostic groups previously ([Itrat et al., 2020](#)). It is possible that stress perception ([Holzle et al., 2020](#)) and changes to social supports and isolation ([Kozloff et al., 2020](#)) could have contributed to psychological deterioration during the prolonged lockdown and thus leading to increased admissions for mood and psychotic disorders. Further, the changed operation of community psychiatric services in Melbourne during the lockdown, e.g., reduced outreach services and difficulties of patients adapting to digital platforms, could have increased social isolation and stress and thus leading to increased admissions for psychotic disorders and mood disorders. Similarly, increased admissions for patients with personality disorders could be related to their poor tolerance to stress associated with prolonged lockdown ([Prete et al., 2020](#)).

The clinical implications of our study are as follows. Firstly, monitoring the rate of inpatient admissions will help adjust intake parameters to meet the needs of local communities as the pandemic and lockdown periods are known risk factors for psychological issues at population level. Secondly, understanding why certain groups of patients are not receiving inpatient treatments can help develop strategies to reach out to these groups of patients, e.g., early identification and treatment through newer approaches such as telehealth. This will help to improve both the mental health and quality of life of the local communities.

Our study has limitations of a retrospective database study such as classification bias and missing information. There are strengths to our study, e.g., investigating long duration of lockdown, modest sample size and inclusion of multiple inpatient units. While our findings need replication in a larger prospective study, we conclude that the prolonged lockdown measures can adversely affect help seeking patterns of vulnerable subgroups of population.

Authors' statement

All authors have equally contributed to the conceptualisation,

literature search, methodology, data analysis and interpretation, and writing and revising the manuscript.

Conflict of interest

The authors have no conflict of interest attached to this submission.

References

- Abbas, M.J., Kronenberg, G., McBride, M., Chari, D., Alam, F., Mukaetova-Ladinska, E., Al-Uzri, M., Brugha, T., 2020. The Early Impact of the COVID-19 Pandemic on Acute Care Mental Health Services. *Psychiatr Serv* <http://doi: 10.1176/appi.ps.202000467>.
- Clerici, M., Durbano, F., Spinogatti, F., Vita, A., de Girolamo, G., Micciolo, R., 2020. Psychiatric hospitalization rates in Italy before and during COVID-19: did they change? An analysis of register data. *Ir J Psychol Med* 37, 283–290.
- Fisher, J.R., Tran, T.D., Hammarberg, K., et al., 2020. Mental health of people in Australia in the first month of COVID-19 restrictions: a national survey. *Med. J. Aust.* 213, 458–464.
- Holzle, P., Aly, L., Frank, W., Forstl, H., Frank, A., 2020. COVID-19 distresses the depressed while schizophrenic patients are unimpressed: A study on psychiatric inpatients. *Psychiatry Res* <http://doi: 10.1016/j.psychres.2020.113175>.
- Itrat, A., Jagadheesan, K., Danivas, V., Lakra, V., 2020. A comparative study of access to inpatient psychiatric treatment in a public mental health service in Melbourne during COVID-19. *Indian J. Psychiatry.* 62, S454–S458.
- Kozloff, N., Mulsant, B.H., Stergiopoulos, V., Voineskos, A.N., 2020. The COVID-19 global pandemic: implications for people with schizophrenia and related disorders. *Schizophr. Bull.* 46, 752–757.
- Preti, E., Di Peirro, R., Fanti, E., Madeddu, F., Calati, R., 2020. Personality disorders in time of pandemic. *Curr. Psychiatry Rep.* 22, 80. <https://doi.org/10.1007/s11920-020-01204-w>.
- Tromans, S., Chester, V., Harrison, H., Pankhania, P., Booth, H., Chakraborty, N., 2020. Patterns of use of secondary mental health services before and during COVID-19 lockdown: observational study. *BJPPsych Open* 6, e117 <http://doi: 10.1192/bjo.2020.104>.
- Organization, World Health, 2020. 2020. The impact of COVID-19 on mental, neurological and substance use services: results of a rapid assessment. World Health Organization, Geneva. Licence: CC BY-NC-SA 3.0 IGO.